

From the Mineral Inventory Files

Turning Silica into Rare Metals

The McMillan silica prospect is an obscure pegmatite-hosted quartz occurrence found atop the plateau forming the west flank of the Country Harbour valley at Country Harbour Mines, Guysborough County (Fig. 1). The prospect consists of two sites where quartz lenses lie at the centre of small, zoned pegmatite intrusions in a medium-grained leucomonzogranite pluton. This unnamed pluton is a small offshoot of the Bull Ridge Pluton found immediately to the south. Local residents have long known of the quartz lenses and say that prospectors did some digging and blasting there in an unsuccessful search for gold.

Well-known local geologist B. E. (Barry) Jones examined the quartz lenses in 1966 as part of his B.Sc. thesis at Acadia University. At the eastern site (Site 1, Fig. 1) Jones described two separate quartz lenses within a 150 m long, northwest-trending pegmatite dyke (inset in Fig. 1). The lenses are up to 6 m wide. The second location (Site 2, Fig. 1) is described as being 3.2 km west of the first site, where Jones found that what had been originally described to him as a single, large quartz mass was actually a series of smaller quartz lenses, a few metres in width each, enveloped by mixed muscovite granite and pegmatite. Of particular interest is the fact that Jones recognized the presence of discrete beryl crystals in some of the pegmatite patches but lack of time prevented him from evaluating this further. He concluded that the sites had little economic potential as a source of silica, but that their potential for beryllium (Be) should be evaluated. Such an evaluation has never been carried out and, in fact, the exact location of these two sites is not accurately known. I unsuccessfully attempted to find the eastern site in 2001 but did locate a different pegmatite of similar dimensions in the same general area. The second site has not been re-located and Figure 1 only indicates its most likely location.

It has long been known that rare metal pegmatites (enriched in Be, Ta,

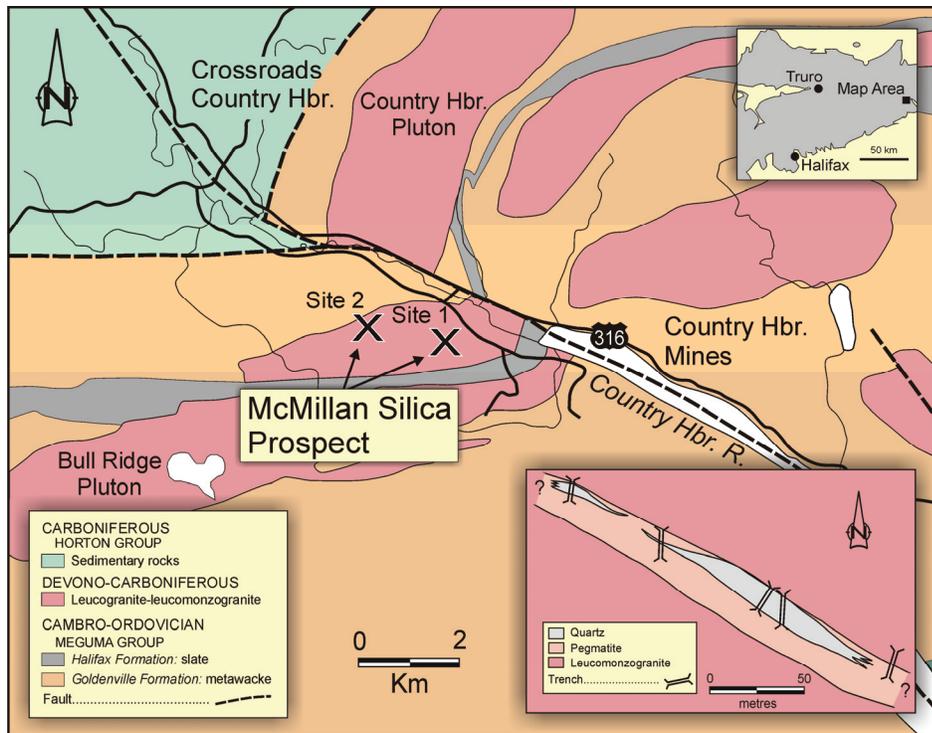


Figure 1. Geology of the Country Harbour area, Guysborough County, showing locations of the two sites that constitute the McMillan silica prospect. Inset shows a plan of Site 1.

Nb, Cs, Li, Rb) occur throughout the Meguma Zone and I have visited many over the years. Two regions seem to host more of these occurrences: (1) southwest Nova Scotia from Liverpool around to Yarmouth; and (2) the Eastern Shore area from Canso-Country Harbour to as far west as Trafalgar. These clusters of rare metal pegmatites occupy areas of the Meguma Zone that have undergone the highest degree of regional metamorphism and, thus, likely represent the deepest burial levels. Globally, rare metal pegmatites are most commonly found in sites near the metamorphic boundary between greenschist facies and amphibolite facies rocks.

As far as rare metal occurrences in Nova Scotia are concerned, grade has not been a problem but tonnage has. I have often thought the key to solve this tonnage issue would be to locate a set-

ting where the very apex of a highly evolved leucogranite intrusion is exposed. Such a zone is referred to as an apogranite, where the most highly evolved end products of the granitic magma are concentrated, resulting in enrichment of the most incompatible elements in a mix of leucogranite and pegmatite. This environment increases the possibility that the rare metal levels in both the pegmatite and enveloping leucogranite could reach a mineable tonnage. Jones's description of the McMillan prospect, especially the western occurrence, is a textbook example of what such an apogranite environment would look like. His recognition of beryl crystals in the pegmatite adds to the clear suggestion that this site has excellent rare metal potential and needs to be evaluated.

G. A. O'Reilly